**Lebanese American University**

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**GNE 337 – Intro To VR**

Instructor: Dr. Evan Fakhoury

**Final Project – Fall 2023**

**The Labyrinth of Shadows**

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# Project Description

“Labyrinth of Shadows” is a captivating virtual reality game that transports players into a world of mystery and suspense. The game begins with the player standing at the entrance of a sprawling labyrinth, shrouded in the stillness of the night. The only source of light is a torch in the player’s hand, casting long, dancing shadows that add to the eerie atmosphere.

The labyrinth itself is a marvel of complexity, a network of winding paths, dead ends, and hidden exits. It’s a place where nothing is as it seems. One moment, you’re walking down a seemingly clear path; the next, you’re facing a wall. The labyrinth is filled with surprises, from moving elevators that change your path to ghostly apparitions that appear out of nowhere.

The game is a sensory experience, with meticulously designed 3D models and animations that bring the labyrinth to life. The rustling of leaves, the distant hoot of an owl, the sudden creak of a door - every sound is designed to heighten the sense of suspense and immersion.

But “Labyrinth of Shadows” is more than just a walk through a maze. It’s a test of intellect and courage. With multiple exits and numerous dead ends, finding your way out is a challenge that requires strategic thinking and careful decision-making. The game keeps track of your progress with a timer, adding a sense of urgency to the adventure.

The game draws inspiration from “The Maze Runner”, creating a sense of horror and anxiety that keeps players on edge. But it’s not just about fear. It’s about the thrill of the unknown, the satisfaction of solving a complex puzzle, the exhilaration of overcoming challenges. It’s a game that tests your bravery, your intellect, and your resolve.

In conclusion, “Labyrinth of Shadows” is a unique VR gaming experience that combines strategy, immersion, and emotional engagement in a thrilling adventure. It’s a journey into the unknown, a test of courage and intellect, a game that promises to be both challenging and rewarding.

# Detailed List of All Features

## HTML COMPONENTS:

1. Scripts:
   1. js/aframe-master.1.0.4.min.js
   2. js/aframe-extras.min.js
   3. js/aframe-physics-system.min.js
   4. js/aframe-spe-particles-component.js
   5. js/aframe-spritesheet-animation.js
   6. js/aframe-environment-component.min.js
   7. https://cdn.jsdelivr.net/npm/aframe-event-set-component@4.0.1/dist/aframe-event-set-component.min.js
   8. https://cdn.rawgit.com/donmccurdy/aframe-extras/v6.0.0/dist/aframe-extras.min.js
2. Assets and images:
   1. Images: Ground, Walls (4 types of walls for different positions in the map), 360 degrees images
   2. Normal Texture: Normal Texture for: Walls, Ground
   3. 3D models (GLTF); League of legends Character, Ghosts, Trophy, Freddy
3. A-scene:
   1. Physics; Gravity, acceleration, static-body, dynamic-body, collision, velocity.
   2. Look-at components: Texts in the waiting (general instructions etc.…)
   3. Entities: A-plane, A-Box, A-Sphere, light
4. Animations:
   1. Dur,
   2. easing linear
   3. Event-sets: click.
   4. Rotation
   5. Position
5. Camera:
   1. Universal controls
   2. Wasd-controls
   3. Cursor + clicking: Geometry, material.
   4. Head: a-sphere, random color
6. Light:
   1. Embedded: with the camera
   2. Light: type: point
   3. Distance
   4. Intensity
7. Spe-Particles:
   1. Fireworks
8. Environment:
   1. Preset: Starry
9. Sound:
   1. Integrating sounds into the game to create a special atmosphere related to the theme of the game.

## CSS COMPONENTS:

1. Counter Display
2. Player-Lives Design
3. Loading-overlay: Loading Screen
4. Game Container: Display: Block
5. Game-Over
6. Game-Over Content
7. Scary Buttons: (All the Buttons)

## JavaScript Components:

1. Creating the map using an array of 1’s and 0’s where the one represents a wall that will be converted to an a-box and the zero represents a clear path (ground)

Using:

if (mazeMatrix[i][j] === 1) {

let box = document.createElement('a-box');

box.setAttribute('position', {

x: j \* size,

y: size / 2,

z: -i \* size});

box.setAttribute('width', size);

box.setAttribute('height', size);

box.setAttribute('depth', size);

box.setAttribute('static-body', '');

1. Dividing the arrays into groups each has its own texture and normal map, for each section of the maze.
2. Some animations would not have worked using the basic animations offered by a-frame, which made us use JavaScript instead.
3. Creating a collision detection not based on A-frame physics generator only using JavaScript.
4. Using functions such as reload (reloading the game), Game Over, timer, moving boxes.
5. Creating a loading screen that alters between 3 images.
6. Creating 3 lives for each player and adding a collision generator engineered by us using JavaScript so when the player hits the shadows 4 times, he will lose the game.
7. Creating a timer using JavaScript
8. Creating a High-Score variable that stores the high score of each player.
9. Creating 3 difficulties modes in the game which the player can choose between easy which he will receive 4 lives, medium 2 lives and hard 1 life.
10. Creating events in such a way when you click on an object, walls will come up or down.
11. Creating a trap in which the player will go in a shortcut but will have limited time to surpass or the walls will close on him and will die.
12. When the player reaches the end, we create an event when fireworks will be launched and after 20 seconds the game will be reloaded, and the player will return to the lobby.

# Links:

1. Presentation: <https://www.canva.com/design/DAF2MqH9T9c/Dj-5gOYhqNqTBb0jOvPOyw/edit?utm_content=DAF2MqH9T9c&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton>
2. GitHub Repository: <https://github.com/Richard-Younes/VR-Maze_Project>
3. Qr code live demo:

A qr code on a white background

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